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10/024,208	12/21/2001	David J. Cooperberg	015290-546	9076

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EXAMINER
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ALEJANDRO MULERO, LUZ L

ART UNIT	PAPER NUMBER
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1792

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PAPER

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APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
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EXAMINER
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ART UNIT	PAPER
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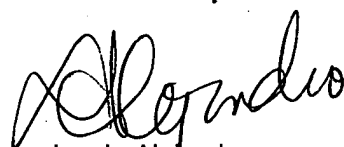
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Commissioner for Patents

See the attached examiner's answer.

A handwritten signature in black ink, appearing to read "Alejandro", is written over the printed name.

Luz L. Alejandro  
Primary Examiner  
Art Unit: 1763



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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/024,208  
Filing Date: December 21, 2001  
Appellant(s): COOPERBERG ET AL.

**MAILED**  
**JAN 07 2008**  
**GROUP 1700**

\_\_\_\_\_  
Edward A. Brown  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 06/14/07 and appeal replacement sections filed 10/09/07, appealing from the Office action mailed 09/07/06.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The following are the related appeals, interferences, and judicial proceedings known to the examiner which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal: the previous appeal of application 10/024,208, decision rendered 04/06/06, in which the examiner was affirmed-in-part.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

A substantially correct copy of appealed claims appears on the Claims Appendix section of the Appendix to the appellant's brief. The minor errors are as follows: the copy of claims 8, 10 and 41 is not correct. The correct copy for claims 8, 10 and 41, is as follow:

8. The system of Claim 1, wherein the gas injector is removably mounted in the dielectric member and supplies the process gas into a central region of the chamber.

10. A plasma processing system comprising:

- a plasma processing chamber;
- a vacuum pump connected to the processing chamber;
- a substrate support on which a substrate is processed within the processing chamber;
- a dielectric member having an interior surface facing the substrate support, wherein the dielectric member forms a wall of the processing chamber;
- a gas injector removably mounted in an opening in the dielectric member and extending through the dielectric member such that a single distal end of the gas injector

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is exposed within the processing chamber, a vacuum seal being provided between the gas injector and the dielectric member, the gas injector including a plurality of gas outlets in the single distal end which are each located below the interior surface of the dielectric member, the gas outlets including at least one on-axis outlet and a plurality of off-axis outlets, the off-axis outlets inject process gas at an acute angle relative to a plane parallel to an exposed surface of the substrate, the gas outlets supplying process gas at flow rates that are independently varied between the on-axis outlets and the off-axis outlets into the processing chamber;

a common gas supply in fluid communication with a first gas line and a second gas line, the first gas line being in fluid communication with the on-axis outlet but not with the off-axis outlets and the second gas line being in fluid communication with the off-axis outlets but not with the on-axis outlet; and

an RF energy source which inductively couples RF energy through the dielectric member and into the chamber to energize the process gas into a plasma state to process the substrate.

41. A plasma processing system, comprising:

- a plasma processing chamber;
- a vacuum pump connected to the processing chamber;
- a substrate support on which a substrate is supported within the processing chamber;

a dielectric member having an interior surface facing the substrate support, the dielectric member forming a wall of the processing chamber;

a gas injector body extending through the dielectric member such that a distal end of the gas injector body is exposed within the processing chamber, the gas injector body including a plurality of gas outlets which are disposed within the processing chamber below the interior surface of the dielectric member, the gas outlets including at least one on-axis outlet and a plurality of off-axis outlets which inject process gas at an acute angle relative to a plane parallel to an exposed surface of the substrate;

a common gas supply in fluid communication with a first gas line and a second gas line, the first gas line being in fluid communication with the at least one on-axis outlet but not with the off-axis outlets and the second gas line being in fluid communication with the off-axis outlets but not with the on-axis outlet;

flow controllers providing independently adjustable flow rates of process gas between the on-axis outlet and the off-axis outlets into the processing chamber; and

an RF energy source which inductively couples RF energy through the dielectric member and into the chamber to energize the process gas into a plasma state to process the substrate.

#### **(8) Evidence Relied Upon**

The following is a listing of the evidence (e.g., patents, publications, Official Notice, and admitted prior art) relied upon in the rejection of claims under appeal.



US 6,450,117	Murugesh et al.	September 17, 2002
US 5,958,140	Arami et al.	September 28, 1999
US 5,532,190	Goodyear et al.	July 2, 1996
US 6,090,210	Ballance et al.	July 18, 2000
WO 00/41212	Ni et al.	July 13, 2000
US 6,287,643	Powell et al.	September 11, 2001

### **(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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Claims 1-11, 13-14, and 39-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ni et al., WO 00/41212 in view of Chang, WO 99/57747 or Murugesh et al., U.S. Patent 6,450,117 and Arami et al., U.S. Patent 5,958,140, or Goodyear et al., U.S. Patent 5,532,190, or Balance et al., U.S. Patent 6,090,210.

Ni et al. shows the invention substantially as claimed including Ni et al. shows the invention substantially as claimed including a plasma processing system used for etching or CVD comprising: a plasma processing chamber 10, a vacuum pump connected to outlet 15 of the processing chamber; a substrate support 12 on which a substrate 13 is processed within the processing chamber; a dielectric member 20 and having an interior surface facing the substrate support, wherein the dielectric member forms a wall of the processing chamber; a gas injector 22 having conical or cylindrical side surfaces and being removably mounted in the dielectric window (see page 13, lines 20-25) and extending through the dielectric member, the gas injector comprising a body including an axial end-face exposed within the processing chamber, a side surface extending axially from the axial end surface, and a plurality of gas outlets supplying process gas at a sonic or supersonic velocity (see page 16, lines 14-15) including at least one on-axis outlet in the axial end surface and a plurality of spaced-apart off-axis outlets in the side surface, the off-axis outlets inject process gas at an acute angle relative to a plane parallel to an exposed surface of the substrate, and an RF energy source 18 comprising an RF antenna in the shape of a planar or non-planar spiral coil which inductively couples RF energy through the dielectric member and into the

chamber to energize the process gas into a plasma state to process the substrate (see, for example, figs. 1 and 3A-3C, and page 9-line 8 to page 10-line 25).

Ni et al. fails to expressly disclose the gas injector including a common gas supply and an annular passage in fluid communication with a first gas line and a second gas line, the first gas line being in fluid communication with the on-axis outlet but not with the off-axis outlets and the second gas line being in fluid communication with the off-axis outlets but not with the on-axis outlets, and flow controllers operable to supply process gas from the common gas supply at flow rates that are independently varied between the on-axis and the off-axis outlets into the processing chamber. Chang discloses a gas injector that comprises an injector body including at least first and second gas inlets, at least first and second gas passages, and at least first and second gas outlets, the first gas passage being in fluid communication with the first inlet and first outlet, and the second gas passage being in fluid communication with the second inlet and second outlet, the first and second gas passages not being in fluid communication with each other (see, for example, figs. 1 and 7, and their descriptions). Alternatively, Murugesh et al. discloses an apparatus comprising a gas injector, the gas injector comprising a body including an axial end surface exposed within the processing chamber, a side surface extending axially from the axial end surface, and a plurality of gas outlets 85/247 including at least one on-axis outlet 85 in the axial end surface and a plurality of circumferentially spaced-apart off-axis outlets in the side surface, a first gas line and a second gas line, the first gas line being in fluid communication with the on-axis outlet but not with the off-axis outlets and the second gas line being in fluid

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communication with the off-axis outlets but not with the on-axis outlet, wherein the outlets are disposed within the chamber and below the chamber ceiling (see, for example, figs. 2a, 2b and 3, and their description, and col. 2, lines 51-55). Therefore, in view of these disclosures, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Ni et al. as to comprise the gas injector suggested by Murugesh et al. and Chang et al. in order to optimize the delivery of gasses into the chamber and in order to direct gas preferentially across a surface of the chamber.

Furthermore, Ni et al., Chang and Murugesh et al. do not expressly disclose a common gas supply including a single third gas line in fluid communication with the first gas line and the second gas line. Arami et al., Goodyear et al., and Ballance et al., disclose an apparatus comprising a gas injecting system in which a common gas supply 41,42,43/55,56 / 314 including a third gas line coming from the gas supply is in fluid communication with a first gas line 38/ 21 / 312 and a second gas line 39/ 22 / 310, the first gas line being in fluid communication with a first outlet and the second line being connected to second outlets, wherein the first line is in fluid communication with the first outlet but not with the second outlets and the second gas line being in fluid communication with the second outlets but not with the first outlet (see, for example, fig. 2 of Arami et al. and its description, fig. 1 of Goodyear et al. and its description, and fig. 8 of Ballance et al. and its description). Therefore, in view of these disclosures, it would have been obvious to one of ordinary skill in the art at the time the invention was made

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to modify the gas supply system of the apparatus of Ni et al. modified by Chang and Murugesh et al. so as to comprise a common gas supply including a single third gas line in fluid communication with the first gas line and the second gas line, in order to enable the injection of the same gas, to the processing chamber, through the on-axis outlet and the off-axis outlets. Furthermore, note that all the references disclose the use of flow controllers operable to supply the process gas from the common gas supply at flow rates that are independently varied toward the first line and the second line. Also, Arami et al. and Goodyear et al. disclose the use of a network of gas valves and throttling elements to independently vary the gas flow.

Additionally, note that the apparatus of Ni et al. modified by Chang and Murugesh et al.: a) the gas injector injects the process gas toward a primary plasma generation zone in the chamber, b) the first gas line is in fluid communication with an axially extending central bore in the injector body, and the second gas line is in fluid communication with an annular gas passage surrounding the central bore, c) the injector body is cylindrical shaped and the off-axis outlets are circumferentially spaced apart, and d) at least one of the on-axis and the off-axis outlets has a uniform diameter along the entire length thereof.

With respect to claim 49, note that Murugesh et al. discloses the use of more than two circumferentially spaced apart off-axis outlets. Furthermore, a prima case of obviousness still exists because it would have been an obvious choice of design to one of ordinary skill in the art to optimize the total number of off-axis outlets during routine experimentation depending upon, for example, the desired locations to which the gas is

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desired to be injected, and would not lend patentability to the instant application absent the showing of unexpected results.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ni et al., WO 00/41212 in view of Chang, WO 99/57747 or Murugesh et al., U.S. Patent 6,450,117, and Arami et al., U.S. Patent 5,958,140, or Goodyear et al., U.S. Patent 5,532,190, or Ballance et al., U.S. Patent 6,090,210 as applied to claims 1-11, 13-14, and 39-61 above, and further in view of Powell et al., U.S. Patent 6,287,643.

Ni et al., Chang, Murugesh et al., Arami et al., Goodyear et al. and Ballance et al. are applied as above but do not expressly disclose that the gas injector is further provided with an electrically conducting shield. Powell et al. discloses an apparatus comprising a gas injection tube 84 provided with an electrically conducting shield (see col. 9, lines 33-50) that minimizes plasma ignition until the gas reaches the main chamber (see Fig. 5 and col. 7-line 57 to col. 9-line 50). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Ni et al. modified by Chang, Murugesh et al., Arami et al., Goodyear et al. or Ballance et al., so as to further comprise an electrically conducting shield for the gas injector in order to minimize the plasma ignition within the injector because plasma ignition within the injector can result in detrimental effects such as damage to the injector as well as uniformity problems with processing within the chamber.

**(10) Response to Argument**

Appellant's arguments filed 06/14/07 have been fully considered but they are not persuasive. Appellant argues that the gas injection system of the Ni et al. reference cannot vary the gas flow rate through the on-axis outlet independently of the gas flow rate through the off-axis gas outlets. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Appellant argues that there are no gas outlets in a side surface of Chang's gas injector. In response to appellant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In response to appellant's argument that in the Murugesh et al. reference a cleaning gas is supplied through the second gas outlets in order to clean the chamber, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. The second gas outlets of the

apparatus of Murugesh et al. are capable of supplying a variety of desired/needed gas(es) to the processing chamber.

In response to appellant's argument with respect to the common gas supply teachings of the Goodyear et al. reference, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. The apparatus of Goodyear et al. is capable of supplying a common gas to the processing chamber.

In response to appellant's argument that the Ballance et al. reference supplies the same gas composition but at difference flow rates, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. The apparatus of Ballance et al. is capable of supplying a common gas at the desired flow rate to the processing chamber.

In response to appellant's argument that each of the gas supply sources 41, 42, and 43 of the Arami et al. reference is in fluid communication with all three of the gas chambers 37A, 37B and 37C, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. The



apparatus of Arami et al. is capable of supplying a common gas supply to the processing apparatus through the three gas chambers.

Concerning appellant's argument that a prima facie case of obviousness has not been established, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation to combine the references is clearly stated in the final rejection.

Appellant argues that the Ni's gas injection system does not include a gas injector including at least one on-axis gas outlet in an axial end surface and a plurality of spaced-apart off-axis outlets in the side surface, which inject process gas at an acute angle relative to the plane parallel to the exposed surface of the substrate. The examiner respectfully disagrees and contends that, as stated in the final rejection, the apparatus disclosed by Ni et al. does comprise such gas injector structure.

Appellant argues that Ni's gas injection system does not includes a common gas supply in fluid communication with a first gas line and a second gas line, where the first gas line is in fluid communication with at least one on-axis outlet but not with off-axis outlets formed in a gas injector body, and the second gas line is in fluid communication with the off-axis outlets but not with the on- axis outlet; and flow controllers operable to supply process gas from the common gas supply at flow rates that are independently

varied between the on-axis outlet and the off-axis outlets into the processing chamber.

In response to appellant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In response to appellant's argument that Ni fails to recognize the etch uniformity problem solved by the claimed plasma processing system with respect to a multi-step etch process, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). Furthermore, it is noted that the features upon which appellant relies (i.e., achieving uniformity in different steps of a multi-step etch process using the same injector) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Appellant argues that the Ni gas injector lacks adjustment capability to independently adjust the flow ratio through the off-axis and the on-axis outlets. In response to appellant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Note that

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the rejection over the claims is not a 35 USC 102 rejection using solely the Ni et al. reference. Instead, the rejection of the claims is under 35 USC 103 using Ni et al. as the primary reference and Chang et al. or Murugesh et al., and Arami et al., Goodyear et al. or Ballance et al. as secondary references, and therefore, the examiner respectfully contends that the combination of the references teaches the claimed gas injector.

Furthermore, with respect to appellant's argument that the modification of Ni et al. would require very extensive engineering design if the references were combined as suggested, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

Concerning appellant's argument that Chang et al. and Murugesh et al. fail to suggest a gas injector having on- and off-axis gas outlets for supplying the same gas into a processing chamber, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). It should be noted that neither Chang nor Murugesh are used to show a gas injection system that supply the same gas from a common gas

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supply to a plurality of gas outlets. The Arami et al., Ballance et al. and Goodyear et al. references have been relied upon to show this feature.

With respect to appellant's argument that Arami et al., Goodyear et al., and Ballance et al. are applied improperly since they disclose showerhead-type injection systems, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Furthermore, the examiner respectfully contends that the Arami et al., Goodyear et al., and Ballance et al. references are only used to show that a common gas supply can be connected to one or more gas supply lines.

In response to appellant's arguments that each of the Arami et al., Goodyear et al., and Ballance et al. references have only on-axis outlets, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Note that the primary reference of Ni et al. is used to show a gas injector comprising both an on-axis outlet and off-axis outlets.

With respect to appellant's argument concerning Goodyear explicitly teaching against a common gas supply which would supply an identical gas composition to the gas lines, the examiner respectfully disagrees with such a statement, but even assuming that such a statement is true, it should be noted that: a) the rejected claims do not require that the common gas supplies identical gas composition to the gas lines,

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and b) such limitation is directed to a method limitation instead of an apparatus limitation, and a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. Note that the apparatus of Ni et al. modified by Chang et al. or Muruges et al. and Arami et al., Goodyear et al. or Ballance et al., is capable of supplying an identical gas composition to the gas lines.

Concerning appellant's argument that the Arami et al. reference does not disclose "only a common gas supply" in fluid communication with the gas outlets, it should be noted that the claim does not requires only a common gas supply, therefore, a reference disclosing more than one gas supply is not precluded from properly rejecting the claims. Furthermore, in response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

In response to appellant's argument that the applied references do not provide a solution to the problem of achieving uniformity during sub-steps of a multi-step etch

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process in a plasma processing chamber including an RF energy source for inductively coupling RF energy into the chamber to produce a plasma, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

With respect to appellant's statements/arguments regarding independent claims 9, 41 and 42, the examiner respectfully contends that, as stated in the final rejection, the primary reference of Ni et al. discloses a gas injector including a plurality of off-axis gas outlets/second gas outlets which injects process gas at an acute angle relative to the plane parallel to the exposed surface of the substrate. Furthermore, note that the apparatus of Ni et al. modified by Chang et al. or Murugesh et al. and Arami et al., Goodyear et al. or Ballance et al. comprises a common gas supply.

Regarding the declaration under 37 CFR 1.132, expected beneficial results are evidence of obviousness of a claimed invention *In re Gershon*, 372 F.2d 535, 538, 152 USPQ 602, 604 (CCPA 1967). In this case, it would have been expected that added controllability to the injector of Ni et al. would allow for improved controllability and better results with respect to different etching processes, as shown by the declaration. Furthermore, a portion of the declaration states that the claimed subject matter solved a problem that was long standing in the art, and that the inventor discovered the source of a problem (see item 4). However, there is no showing that others of ordinary skill in the art were working on the problem and if so, for how long. In addition, there is no

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evidence that if persons skilled in the art who were presumably working on the problem knew of the teachings of the above cited references, they would still be unable to solve the problem. See MPEP § 716.04. In view of the foregoing, when all of the evidence is considered, the totality of the rebuttal evidence of nonobviousness fails to outweigh the evidence of obviousness.

With respect to appellant's argument that Ni et al. does not disclose a "conical" side surface or off axis outlets in a side surface of the injector, appellant is respectfully directed to, for example, figs. 3A-3C which clearly show conical surfaces. Furthermore, as stated by the Board of Patent Appeals, Ni et al. would have taught "that the injector can have outlets in different configurations, including a center outlet or no outlet in the axial end surface...", and therefore, to the extent that the examiner understands the rejection from the Board of Patent Appeals, the limitation of claim 7 is taught by the combination of the applied references.

With respect to appellant's argument that the Arami et al. reference does not suggest "a common gas supply" (note that in this argument applicant does not use the word only), it should be noted that Arami et al. does disclose a common gas supply, for example, gas supply 41, connected to the gas outlets. Note that as broadly claimed, a reference disclosing more than one gas supply is not precluded from properly rejecting the claims. Furthermore, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

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In response to applicant's arguments against the Powell et al. reference individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

**(11) Related Proceeding(s) Appendix**

Copies of the court or Board decision(s) identified in the Related Appeals and Interferences section of this examiner's answer are provided within the instant application.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,



**LUZ ALEJANDRO-MULERO**  
**PRIMARY EXAMINER**

Conferees:



**PARVIZ HASSANZADEH**  
**SUPERVISORY PATENT EXAMINER**



**GREGORY MILLS**  
**QUALITY ASSURANCE SPECIALIST**